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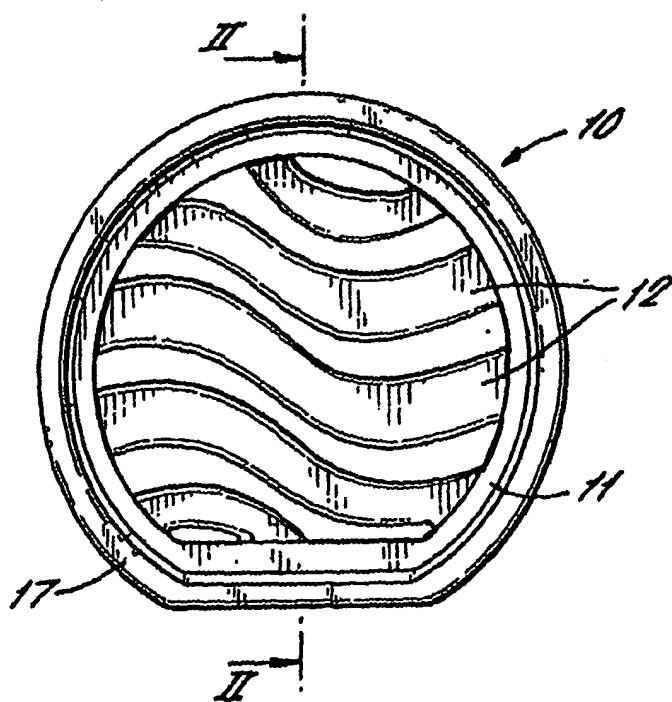
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**Declarations under Rule 4.17:**

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU,

*[Continued on next page]*

(54) Title: IMPROVEMENTS IN OR RELATING TO AIR FRESHENING DEVICES



(57) **Abstract:** The invention relates to improvements in or relating to containers and in particular to a refill for an air freshening or purifying device utilising a gel fragrance or other gel composition and to a device comprising a base container refill. The invention specifically comprises a refill for use with an air freshening or purifying device, said refill comprising a refill container having a gel receiving surface and an opposing rear surface, the gel receiving surface having at least one recess in which is contained a gel composition, wherein the profile of the rear surface inversely corresponds to the profile of the gel receiving surface such that it is provided with at least one projection inversely corresponding to the said recess in the gel receiving surface.



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UZ, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS,  
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CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)*  
— of inventorship (Rule 4.17(iv)) for US only

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

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**Published:**

- with international search report

IMPROVEMENTS IN OR RELATING TO AIR FRESHENING DEVICES

The invention relates to improvements in or relating to containers and in particular to an air freshening or 5. purifying device utilising a gel fragrance or other gel composition comprising a base container and refill kit.

US-A-5780527 describes a gel which can be used as a fragrancing component in an air freshening device. This 10 gel is particularly advantageous in that it can be used in attractively shaped open containers without the need for sealing. One air freshening device which is currently on the market comprises an attractive glass open sided container, which is recessed to form a dish 15 with a base and circumferential side wall. The dish stands upright on a flattened section of its perimeter. A plurality of ridges are provided on the inner surface of the container base defining channels between the ridges, in which the gel is retained. As the fragrance 20 is dissipated over time, the gel shrinks and cracks and is no longer wholly supported by the ridge walls. To prevent the shrinking gel from falling out of the container, a number of smallish channels are used, which are fairly narrow or have narrow sections.

25

It is desirous for the consumer to have a means of refilling the container once the gel fragrance has dissipated. However, as the filling process comprises the steps of filling the channels with the gel in liquid 30 form and allowing the gel to set, this is not a process which the consumer is able to carry out.

It is therefore an object of the present invention to provide an air freshening or purifying device which utilises a gel fragrance or other gel composition supplied in a refill container.

5

According to the present invention there is therefore provided an air freshening or purifying device comprising a primary container having a gel receiving surface having at least one recess for receiving a gel 10 composition, and a refill container having a gel receiving surface profiled to correspond to the gel receiving surface of the primary container and having at least one recess for receiving a gel composition, said refill container further having an opposing rear surface 15 the profile of which inversely corresponds to the gel receiving surface of the primary container and is dimensioned so as to abut closely with and interlock with the gel receiving surface of the primary container so as to be retained thereby.

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The refill container is preferably made from plastic material. The thickness of the refill container is preferably substantially uniform.

25

The refill container is preferably transparent or translucent. It is desirably clear although it may be coloured, for example, to match the colour of the gel or to provide a visual indicator of the scent of the gel or to match the colour of the container.

Preferably the gel receiving surfaces comprise a plurality of channels and ridges. Desirably the device has from 2 to 6 channels.

- 5       The gel composition is preferably a fragrance or air purifying composition, or an insecticide. The gel may be as described in, for example, US-A-5780527. Thus it is, for example, a gel resulting from the cross-linking, in situ, of a homopolymer or  
10 copolymer in the presence of a perfuming, deodorising or insecticidal base. A suitable copolymer is maleinised polybutadiene or polyisoprene such as Lithene N4-9000 10MA (Registered Trade Mark) obtainable from Revertex Ltd. A suitable cross-linking agent, for example, a  
15 diamine, being a low molecular weight "polymer" containing two amine groups per molecule sold under the name Jeffamine 400 (Registered Trade Mark) obtainable from Huntsman Corp.
- 20       The material from which the refill container is made may have a substantially similar refractive index to the air freshening or purifying device with which it is intended to be used. Ideally the difference between the refractive indices is +/- 0.15 units, although more  
25 preferably it is zero.

- 30       Preferably there is no air gap between the container and the refill container. Either a composition may be provided between the two containers to exclude any air gap or the containers are dimensioned so as to exclude

any air gap. Preferably the composition should have a refractive index lying between those of the containers.

A preferred embodiment of the present invention  
5 will now be described, by way of example only, with  
reference to the accompanying drawings in which:-

Fig. 1 is a front elevation of an air freshening device with which the refill container of the present  
10 invention is to be used;

Fig. 2 is a cross-sectional side elevation of the air freshening device of Fig. 1 on the line.II-II; and

15 Fig. 3 is a cross-sectional side elevation of a refill container for use with the device of Fig. 1.

Referring to Fig. 1 there is shown an air freshening (or purifying) device 10. The device 10 comprises a  
20 container 11 having a base 13 and preferably a circumferential side wall 17. Although the container 11 illustrated is substantially circular, other shapes can easily be used. The container 11 is preferably made from clear, translucent and/or coloured glass, although other  
25 suitable reasonably rigid impermeable materials could be used.

On the inner surface of the container base 13 are provided a series of projections in the form of ridges  
30 14, defining therebetween recesses in the form of

channels 12. The profile of the ridges 14 is not limited to that shown. It is preferred that some or part of the channels 12 are reasonably narrow in this embodiment to hold the gel where it shrinks or cracks, or that

5 additional means are provided to help hold the gel in the recesses. The channels 12 and ridges 14 may be formed by either recessing the base 13 or adding the ridges 14 to the base 13. The channels 12 and ridges 14 preferably provide an attractive pattern. The inner surface of the

10 side wall 17, the inner surface of the base 13 and the profiled surface formed by the surfaces of the channels 12 and ridges 14 form a gel receiving surface. When the container 11 is filled with a gel composition, preferably of the type described in US-A-5780527, which is

15 preferably strongly coloured, the shape of the channels 12 is highlighted to give an attractive appearance.

An alternative air freshening device (not shown) may have a single recess for receiving the gel in an

20 otherwise planar surface of the base 13.

In accordance with the invention, a refill container 15 is provided for use either when the original gel composition in the air freshening device 10 has

25 dissipated or to avoid the need for initial filling of the device 10. The refill container 15 is preferably made of a transparent plastic or other impermeable material. Prime examples of suitable materials are APET, PETG, Polypropylene and Polyacrylonitrile as these have a

30 high degree of clarity, are easy to thermoform and are

resistant to attack by perfume. Further materials may comprise Polyethylene and Nylon, although these tend to be translucent or of a milky appearance, or PVC, Polystyrene and Styrene-Acrylonitrile, although these may 5 be susceptible to fragrance attack.

The refill container 15 may also be translucent and/or coloured, for use with an air freshening device 10 which has a container 11 which is translucent and/or 10 coloured. The colour used may be suggestive of the fragrance of the gel composition, e.g. yellow for lemon, pink for rose etc. The thickness of the material of the refill container 15 is preferably substantially uniform.

15 The refill container 15 also preferably has a circumferential sidewall 21, and a base 22 having at least one recess. In the embodiment illustrated the base is formed by a plurality of channels 18 defined by ridges 19, the upper profile of which preferably matches that of 20 the original container 11, although this is not strictly necessary. The inner surfaces of the sidewall 21 and base 22 and the surfaces of the ridges 19 and channels 18 form a gel receiving surface. However the profile of the opposing rear surface of the container 15, preferably 25 inversely corresponds to the profile of the gel receiving surface, such that it has at least one projection inversely corresponding to the at least one recess. In the embodiment illustrated, where the gel receiving surface has a plurality of ridges 19 the rear surface of 30 the refill container 15 has a plurality of recesses 16

which are sized to receive the ridges 14 of the main container 11. Similarly where there are a plurality of channels 18 in the gel receiving surface of refill container 15, these form a plurality of ridges 20 in the 5 rear surface of the container 15. These ridges 20 are sized to fit in the channels 12 of the container 11. The refill container 15 is filled with the gel composition in a similar manner to the container 11.

10 Once the gel composition in the original air freshening device 10 has dissipated, and any residue removed from the container 11, the refill container 15 can be positioned so that its rear surface abuts the gel receiving surface of the container 11.

15 Alternatively the air freshening device 10 may be sold with a refill container 15 already in situ. This advantageously eliminates the need for cleansing the container 15 before it can be used with a refill.

20 Where the materials used for both containers 11, 15 are transparent or are of the same colour, the refill container 15 cannot be seen as a separate component from the container 11. To enhance this it is preferred that 25 the refractive indices of the materials of the containers 11, 15 are substantially the same and that the abutting profiles are sized and shaped so as to ensure there is no air gap between the containers 11, 15. However, the difference between the refractive indices of the material 30 is preferably +/- 0.15 units and more preferably zero.

Alternatively a composition may be provided between the containers 11, 15 to exclude any air gap therebetween. In this case the composition ideally has a refractive index lying between that of the containers 11, 15 or, if 5 they have the same refractive index, the same as that.

The relative sizing and interlocking nature of the profiles of the containers 11, 15 ensures that the refill container 15 is held firmly in position by the container 10 11, although a releasable adhesive could be used to ensure this.

Once the gel composition in the refill container 15 has dissipated over time, the refill container 15 can 15 simply be removed from the container and a new one inserted.

The refill container 15 is manufactured by a suitable method, such as vacuum forming, thermoforming or 20 injection moulding. The channels 18 are then filled with the gel composition in liquid form and the gel allowed to set.

The refills can conveniently be provided with a 25 removable lid, in the form of a tear off plastic or foil cover, to protect the gel before use. The shape of the refills also allows them to conveniently be stacked, so that a number can be sold together in a tube packaging.

The refill may be filled with a gel fragrance, which would provide as air freshening action, or with other gel based air purifying compositions, such as insecticides or disinfectants. Thus one container 11 could be used for a 5 variety of different applications, merely by changing the refill container 15 filled with the required composition.

CLAIMS:

1. An air freshening or purifying device comprising a primary container having a gel receiving surface having  
5 at least one recess for receiving a gel composition, and a refill container having a gel receiving surface profiled to correspond to the gel receiving surface of the primary container and having at least one recess for receiving a gel composition, said refill container  
10 further having an opposing rear surface the profile of which inversely corresponds to the gel receiving surface of the primary container and is dimensioned so as to abut closely with and interlock with the gel receiving surface of the primary container so as to be relevant thereby.

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2. A device as claimed in claim 1 in which the refill container is made from a plastics material.

3. A device as claimed in claim 1 or claim 2 in which  
20 the thickness of the refill container is substantially uniform.

4. A device as claimed in any one of the preceding claims in which the refill container is transparent.

25

5. A device as claimed in any one of claims 1 to 3 in which the refill container is translucent.

6. A device as claimed in any one of claims 1 to 5 in  
30 which the refill container is coloured.

7. A device as claimed in any one of the preceding claims in which the gel receiving surfaces comprise a plurality of channels and ridges.
- 5 8. A device as claimed in claim 7 in which there are from 2 to 6 channels in the gel receiving surfaces.
9. A device as claimed in any one of the preceding claims in which the gel composition is a fragrance.
- 10 10. A device as claimed in any one of claims 1 to 8 in which the gel composition is an insecticide.
11. A device as claimed in any one of the preceding  
15 claims in which the material from which the refill container is made has a substantially identical refractive index to the primary container.
12. A device as claimed in any one of the preceding  
20 claims in which the difference between the refractive indices of the material from which the refill container is made and that of the primary container is +/- 0.15 units.
- 25 13. A device as claimed in any one of the preceding claims in which there is no air gap between the primary container and the refill container.

14. A device as claimed in claim 13 in which a composition is provided between the two containers to exclude any air gap.

5 15. A device as claimed in claim 14 in which the refractive index of the composition lies between the refractive indices of the two containers.

16. A device as claimed in claim 13 in which the  
10 containers are dimensioned so as to exclude any air gap.

17. An air freshening or purifying device substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

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X FIG. 1

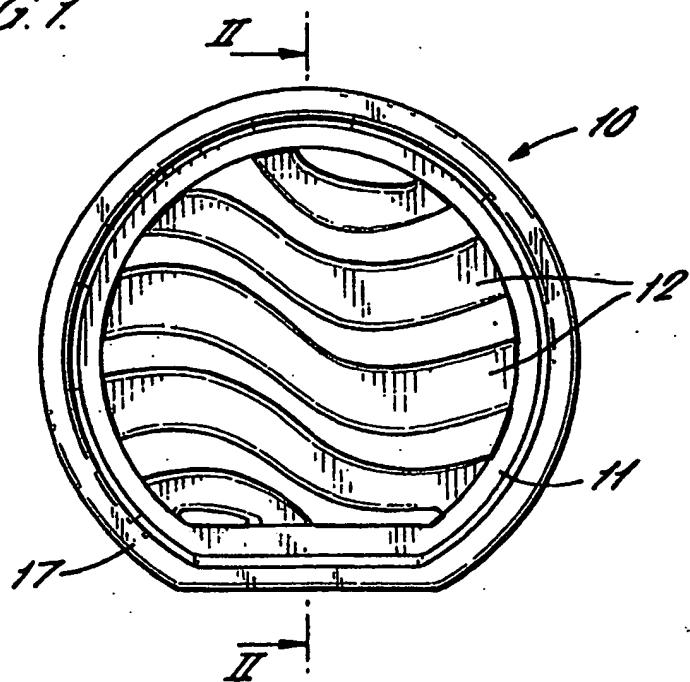


FIG. 2.

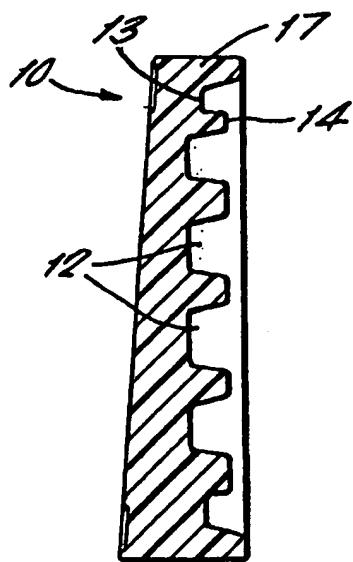
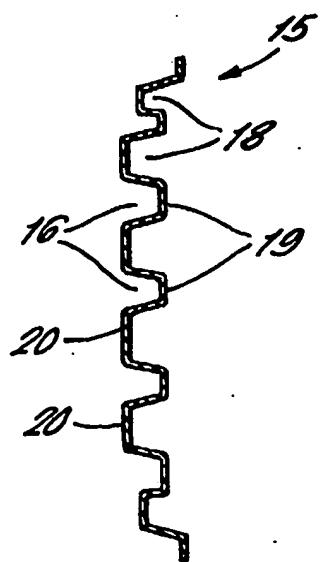


FIG. 3.



## INTERNATIONAL SEARCH REPORT

Final Application No

/GB 02/01419

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC 7 A61L2/04 A61L2/12

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 419 879 A (VLAHAKIS EFTICHIOS V ET AL) 30 May 1995 (1995-05-30) column 3, line 67 -column 6, line 68 column 10, line 14-26; figures 2,4-7 ---	1-7, 9-13,16
X	US 4 572 375 A (BAER CARL D) 25 February 1986 (1986-02-25) column 1, line 34 -column 3, line 53 column 4, line 33-42; figures 2,3 ---	1-6,9, 10,13,16
X	US 6 080 367 A (LIN JUN-RU) 27 June 2000 (2000-06-27) the whole document ---	1-9 -/-

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

## \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the International filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the International filing date but later than the priority date claimed

- \*T\* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*&\* document member of the same patent family

Date of the actual completion of the International search

5 July 2002

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05/08/2002

Name and mailing address of the ISA

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 00 24434 A (LEARY NICHOLAS O ;RECKITT & COLMANN PROD LTD (GB)) 4 May 2000 (2000-05-04) page 3, line 17 -page 5, line 33 page 8, line 5 -page 13, line 14; figures 1-6; example 1 -----	1-16

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/GB 02/01419

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.: 17 because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:  
see FURTHER INFORMATION sheet PCT/ISA/210
  
3.  Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1.  As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3.  As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 17

Claim 17 aims at defining a device with reference to the drawings accompanying the application. No specific structural features are mentioned. This renders the subject-matter for which protection is sought completely vague and unclear, so that no meaningful search of this claim is possible (Article 6 and Rule 6.2(a) PCT).

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

## Information on patent family members

International Application No  
PCT/GB 02/01419

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
US 5419879	A	30-05-1995	US CA	5324490 A 2102278 A1	28-06-1994 03-05-1994	
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